

## WHAT IS CLAIMED:

1. A conformal air defense (CAD) system adapted to be attached externally to an aircraft as an appendage, the system comprising:
  - a conformal mounting adapter having an aircraft-to-adapter interface and upper adapter side;
  - a mounting structure having an adapter interface and a mounting side, said adapter interface attached to said upper adapter side;
  - a missile countermeasures system mounted on said mounting side of said mounting structure; and
  - a cover substantially enclosing said countermeasures system, said cover removably fastened to said mounting side of said mounting structure.
2. The system according to claim 1, wherein said aircraft-to-adapter interface is adapted to conform to a surface of the aircraft.
3. The system according to claim 1, wherein said CAD system is a standalone unit requiring only a power source from the aircraft.
4. The system according to claim 1, said cover having a canoe shape.
5. The system according to claim 4, said cover having a starboard side surface and port side surface oriented in a longitudinal manner which connect together to form a leading and trailing edge.
6. The system according to claim 5, said cover having a bottom surface with exterior edges connected to lower edges of said starboard side surface and port side surface, said bottom surface extending and connecting to said leading and trailing edge.
7. The system according to claim 1, said cover having a half-spherical shape.
8. The system according to claim 1, said cover having a tear drop shape.
9. The system according to claim 1, said cover having an elliptical bubble shape.
10. The system according to claim 1, said cover having at least one turret opening adapted to receive a rotating laser turret.
11. The system according to claim 11, said at least one turret opening located on said bottom surface of said cover.
12. The system according to claim 1, said cover having at least one infrared transmissive window.

13. The system according to claim 1, said cover having at least one fairing opening to receive an sensor housing mounting structure.
14. The system according to claim 1, said countermeasures system including at least one sensor, at least one rotating laser turret, at least one electronic box, and a single power cable.
15. The system according to claim 1, said mounting structure including at least one sensor mounting structure, at least one laser turret mounting structure, and at least one mounting support.
16. The system according to claim 1, wherein said countermeasures system operates autonomously requiring no crew interaction via aircraft cabin controls.
17. The system according to claim 1, said conformal mounting adapter having an aircraft-to-adapter interface adapted to fit specific aircraft mold lines and structural mounting provisions.
18. The system according to claim 1, said mounting structure, said missile countermeasures system, and said cover provided as a single common line replacement unit capable of being installed on a plurality of aircraft designs.
19. The system according to claim 1, said countermeasures system comprising:
  - at least one missile detection and warning receiver to observe attacks;
  - a countermeasure processor to verify an attack and direct a countermeasure response;
  - a gimballed fine track sensor that acquires and tracks attacking missiles; and
  - a modulated directed infrared countermeasure source for jamming and disrupting the missile guidance capabilities.
20. The system according to claim 19, said countermeasures system comprising a Directional Infrared Countermeasures (DIRCM) system.
21. A method for fitting a commercial aircraft with a conformal airliner defense (CAD) system, the system comprising a countermeasures system contained within a conformal external mounting system, the method comprising:
  - attaching a conformal mounting adapter to an exterior of an aircraft;
  - fastening a mounting support structure, with the countermeasures system mounted thereon, to the conformal mounting adapter; and

fastening a cover to the support structure which substantially encloses the countermeasures system.

22. The method according to claim 21, further comprising connecting a power cable connector from the countermeasures system to a power connector on the aircraft.

23. The method according to claim 21, further comprising performing a diagnostic check-out of the countermeasures system prior to installation onto the aircraft, wherein the diagnostic check-out is performed independently of the aircraft.

24. A conformal external mounting system for a missile countermeasures system, said system adapted to be exteriorly mounted to a fuselage of an aircraft as an appendage, said system comprising:

- a conformal mounting adapter configured to be attached to an aircraft fuselage;

- a mounting structure configured to be fastened to said conformal mounting adapter and configured to receive a missile countermeasures system; and

- a cover configured to substantially enclose said mounting structure and countermeasures system;

wherein said conformal external mounting system and the missile countermeasures system can be at least one of removed, replaced and installed as a complete and entire line replaceable unit.

25. The conformal external mounting system according to claim 24, wherein a single electrical power cord is provided from the countermeasures system to be connected to an aircraft's power supply harness.

26. An aircraft in combination with a conformal airliner defense system (CAD) exteriorly attached as an appendage to said aircraft, said CAD system comprising:

- a conformal mounting adapter attached to an exterior surface of said aircraft;

- a mounting structure attached to an upper surface of said mounting adapter;

- a missile countermeasures system mounted onto said support structure; and

- a cover substantially enclosing said countermeasures system and removably fastened to said support structure;

wherein said mounting adapter, mounting structure, and said cover are configured to form an aerodynamic appendage;

wherein said countermeasures system is substantially self-contained, standalone and completely operable independent of pilot input and control, requiring only a power source from said aircraft's power supply.

27. The aircraft and CAD system according to claim 26, said mounting structure constructed such that components of the countermeasures system are held in alignment with respect to one another through said aircraft's operating regime.